



(19) Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) EP 0 373 762 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
15.01.1997 Bulletin 1997/03

(51) Int. Cl.⁶: **A61B 17/10**

(21) Application number: **89311463.7**

(22) Date of filing: **06.11.1989**

(54) Surgical stapler cartridge lockout device

Patronenaussperrvorrichtung eines chirurgischen Klammersetgerätes

Dispositif de blocage pour cartouche d'agrafeuse chirurgicale

(84) Designated Contracting States:
BE DE ES FR GB IT LU NL SE

• Nobis, Rudolph H.
Cincinnati, OH 45236 (US)
• Nuchols, Richard P.
Beavercreek, OH 45385 (US)

(30) Priority: **07.11.1988 US 267907**

(74) Representative: Fisher, Adrian John et al
CARPMAELS & RANSFORD
43 Bloomsbury Square
London WC1A 2RA (GB)

(43) Date of publication of application:
20.06.1990 Bulletin 1990/25

(73) Proprietor: ETHICON INC.
Somerville New Jersey 08876 (US)

(72) Inventors:
• Fox, William D.
New Richmond, OH (US)

(56) References cited:
EP-A- 0 068 046 DE-A- 2 744 824
US-A- 4 506 819

BEST AVAILABLE COPY

EP 0 373 762 B1

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

DescriptionField of the Invention

This invention is generally related to a device for prevention of refiring of surgical staplers. More specifically, this invention is related to a device which prevents the refiring and reloading of a spent staple cartridge in a surgical stapler.

5

Background of the Invention

Surgical staplers have become a very typical form of wound closure during surgery. These surgical staplers can perform various functions such as closing internal wounds, as well as suturing skin. Many of these surgical staplers have reloadable cartridges. These cartridges allow for the rapid reloading of the surgical stapler during the operation. That is, the stapler can be used, the spent cartridge removed, and the surgical stapler reloaded with another cartridge and ready for use.

10

One problem, however, is the refiring of staplers containing spent cartridges. In other words, during the course of surgery it may be possible for the surgeon to use the surgical stapler and then inadvertently not reload the stapler with an unused cartridge. The stapler is then inserted into the wound for use, and then fired. Of course, because the cartridge is already spent, the stapler will not be able to fire another round of staples. This results in a delay while reloading the surgical stapler.

15

DE-A-2744824 discloses a cartridge containing surgical staples and having a path in which a firing means from a surgical stapler can move in order to fire the stapler. The cartridge includes a lockout mechanism comprising a spring-biased firing barrier and a pusher member. When the cartridge contains staples, the firing means of a stapler acts on the pusher member, which itself pushes a staple through the cartridge. The staple rides up a pair of ramps and moves the barrier against its spring bias to clear the path of the pusher member. In the absence of staples, the firing barrier remains in place and prevents the pusher member from moving.

20

Summary of the Invention

25

It is therefore an object of the present invention to provide a means with which to prevent a spent staple cartridge from being fired.

30

It is further an object of the present invention to provide a means with which to prevent a spent staple cartridge from being unloaded from a surgical stapler and then being reloaded into any other surgical stapler.

35

These and other objects of the invention are accomplished by a cartridge according to claim 1.

40

Brief Description of the Drawings

45

The objects of the present invention will be more

fully described in the following detailed description of the invention when taken in conjunction with the accompanying drawings wherein:

Fig. 1 is an exploded view in perspective of a surgical stapler loaded with a cartridge containing the lockout mechanism of the present invention;

Fig. 2 is an elevation view of the lockout mechanism of the present invention during actuation of the lockout mechanism at the beginning of the stroke of the surgical stapler;

Fig. 3 is an elevation view and partial cross section of the present invention further along the stroke;

Fig. 4 is an elevation view and partial cross section with the firing mechanism activated and the surgical stapler unable to be reloaded;

Fig. 5 is an exploded view in perspective of the surgical staple cartridge with the lockout mechanism activated;

Fig. 6 is a top plan view of a preferred embodiment of a preloaded lockout mechanism of the present invention;

Fig. 7 is a top plan view of a preferred embodiment of the lockout mechanism of the present invention in lockout position;

Fig. 8 is a top plan view of a preferred embodiment of the present invention shown in both the loaded and lockout positions;

Fig. 9 is a top plan view of the preferred embodiment of the present invention;

Fig. 10 is an additional preferred embodiment of the lockout barrier aspect of the present invention;

Fig. 11 is a partial view of the actuated barrier aspect of the present invention.

Detailed Description of the Drawings

As seen in Figure 1, a typical surgical stapler 10 will have an upper jaw 20, firing means 30, a lower jaw of 40 and a staple cartridge 50 which fits within the lower jaw 40. The firing means 30 will generally comprise a pusher bar or firing wedge 32, as best seen in Figs. 2, 3, and 4. Returning to Fig. 1, the firing means 30 will also contain a knife 34 which generally will be placed between the firing wedges 32. The firing wedges 32 will fit within longitudinal slots 33 located on the staple cartridge 50, as best seen in Fig. 5. Continuing with Fig. 5, the cartridge 50 will contain parallel side walls 51 which fit within the lower jaw channel 44. As seen in Fig. 1, a

firing knob 42 activates the firing means 30 in order to send the firing wedges 32 through the staple cartridge 50.

When the firing wedges 32 pass through the longitudinal slots 33 in the staple cartridge 50, the firing wedges 32 come into contact with drivers 52. These drivers 52 are best seen in Fig. 6 or Fig. 8. The drivers 52 will activate staples not shown so that the staples will be ejected from the slots 53 seen in Fig. 5. On the upper jaw 20, there is an anvil not shown which will form the staples when they are driven through the slots 53.

One aspect of the present invention is seen in Figs. 2, 3 and 4. When the firing wedge 32 travels through the staple cartridge 50, and is activating drivers 52, it will come into contact with a lockout mechanism 90. This lockout mechanism 90 is comprised of a strip 92 which has a front end 94. This front end 94 is spring loaded and sits within a hollow 59 of the staple cartridge 50. When the firing wedge 32 advances far enough into the staple cartridge 50, the front end 94 of the strip 92 is activated so that it moves entirely within the hollow 59. An indicator flag 58 is then activated to demonstrate the firing of the staples. When this strip 92 continues to move forward in the staple cartridge 50, a detent means 98 is moved away from a barrier lock 96, as seen in Fig. 3. When the firing wedges 32 are retracted from the staple cartridge 50, the barrier lock 96 is able to move into the path of the firing wedge 32, as seen in Fig. 4. At this point, therefore, the firing wedge 32 is no longer able to move through the longitudinal slots 33 of the staple cartridge, because it is blocked by the barrier lock 96. Thus, the lockout mechanism 90 prevents refiring of the spent staple cartridge 50. Of course, because the indicator flag 58 is activated, the user acknowledges this fact and can reload the stapler 10 with a new unused staple cartridge 50.

An additional aspect of the lockout mechanism of the present invention is shown in Fig. 5. There is seen lockout spring or barrier 80. This barrier 80 comprises ears 81 which are fit under a cover or sleeve 82. The ears 81 are urged away from the staple cartridge 50 by means of a spring 84, which is generally a leaf spring integral with the lockout mechanism 80. When the strip 92 is moved forward in the staple cartridge 50 to activate the indicator flag 58 (also shown in Fig. 5), the outer wall 86 of the strip 92 also moves forward. This causes the ears 81 to be displaced from beneath the cover or sleeve 82. Of course, because the staple cartridge is seated within the lower jaw channel 44, the ears 81 are not displaced away from the sides of the walls 51 of the staple cartridge 50. However, when the staple cartridge is removed from the stapler 10, the ears 81 are activated by the leaf spring 84 in order to be displaced away from the walls 51. At this point, then, the staple cartridge 50 is no longer insertable within the lower jaw channel 44. Again, the indicator flag 58 has been activated to show that the staple cartridge 50 is spent. Thus, the user is prevented from reloading the spent staple cartridge 50 and will only be able to load an

unused staple cartridge 50.

Another aspect of the lockout mechanism of the present invention is demonstrated in Figs. 6 and 7. Here is seen firing barrier 60. This firing barrier 60 comprises a spring loaded blocking leg 62 and a base leg 64. This spring loaded blocking leg 62 is generally urged away from the base leg 64 by a first spring 63, which will generally be a leaf spring similar to the leaf spring 84 in the lockout mechanism 80.

When the staple cartridge has yet to be fired, the drivers 52 in the staple cartridge hold the firing barrier 60 between the drivers 52. The firing barrier 60 is held in place around a knob 54 molded into the staple cartridge 50. When the firing wedges 32 pass through the staple cartridge 50 in order to activate the drivers 52, the drivers 52 are moved down these slots 53 so that the area once occupied by the drivers 52 is evacuated. When this happens, the spring loaded blocking leg 62 is able to be moved by the first spring 63 away from the base leg 64. In addition, the base leg 64 is also able to be moved within a cut-out 56 made in the staple cartridge 50.

This position of the firing barrier 60 will prevent the refiring of the pusher bars or firing wedges 32 after they have been retracted from the staple cartridge 50. In addition, because the spring loaded blocking legs 62 will generally have a resting position wider than the width of the staple cartridge 50, when the staple cartridge 50 is removed from the lower jaw channel 44 of the surgical stapler 10, the spring loaded blocking leg 62 will rest in a wider position than the staple cartridge 50. This prevents reloading of the spent staple cartridge 50, so that only an unused staple cartridge 50 can be inserted into the surgical stapler 10.

A further aspect of the present invention can be seen in Figs. 8 and 9. This aspect comprises firing barrier 70 which operates much on the same basis as firing barrier 60. The firing barrier 70 contains a spring-loaded base 72 which is held in place within the staple cartridge 50. There is also a blocking portion 74 which is generally urged by the spring-loaded base 72 to a position in the path of the firing wedges 32. Generally, the drivers 52 will hold the firing barrier 70 in place between the drivers 52. However, when the firing wedge 32 activates the drivers 52, the firing barrier 70 is urged into the path of the firing wedges 32. At that point, the firing wedges 32 can no longer pass through the staple cartridge 50. The spent staple cartridge 50 must be replaced with a unused staple cartridge 50.

One final aspect of the present invention is shown in Figs. 10 and 11. There is shown a reloading barrier 180, comprising ears 181 and pivoting cover 182. The ears 181 are generally urged by a spring force outside the walls 51 of the staple cartridge 50. Generally, the pivoting cover 182 holds the ear 181 in place within the walls 51 of the staple cartridge 50. However, when the firing wedge 32 of the firing means 30 is sent through the staple cartridge 50 to activate the drivers 52, the firing wedge 32 also comes into contact with the pivoting

cover 182. This causes the ears 181 of the staple cartridge to be urged by their spring force to a position where they will remain outside of the walls 51 of the staple cartridge 50. Thus, when the staple cartridge 50 is removed from the lower jaw channel 44 of the surgical stapler 10, the ears 181 relax to a point where they become wider than the width of the staple cartridge 50. This prevents reloading of the staple cartridge 50 within the lower jaw channel 44 of the surgical stapler 10. Only an unused staple cartridge 50 will be able to be loaded into the stapler 10.

The unique combination of features possessed by the present invention render them well suited for use within a surgical stapler, in order to prevent refiring or reloading of a spent surgical staple cartridge. This enhances speed and time of performance for the surgeon. Naturally, these combinations may be useful for other types of cartridge-loading mechanisms. Of course, while several means are available, the particular advantageous embodiments have been chosen to illustrate the invention. It will be understood by those skilled in the art that various changes and modifications may be made in the invention without departing from its scope, which is defined by the following claims.

5

15

20

25

25

Claims

1. A cartridge (50) which is releasably fastenable to a surgical stapler, said cartridge containing surgical staples and having a path (33) wherein a firing means (32) from a surgical stapler can move in order to fire said stapler, and a lockout mechanism comprising:

30

a firing barrier (62, 74, 96) loaded by a spring (63, 72), said barrier preloaded on said cartridge before the insertion of said cartridge into a surgical stapler, said spring being actuatable upon the firing of said stapler by a firing means located on said stapler, such that said barrier is caused by said spring to move into said path to prevent the refiring of said stapler loaded with said spent cartridge; and

35

40

a reloading barrier (81, 181) which is movable between a firing position and a blocking position, and which is biased towards said blocking position such that the firing of said firing means causes said reloading barrier to pass from said firing position to said blocking position, said reloading barrier in said blocking position being adapted to prevent the reloading of said spent cartridge in a stapler upon the removal of said spent cartridge from said stapler.

45

2. A staple cartridge according to claim 1 further comprising an indicator flag (58) actuatable upon the firing of said staples to indicate said firing.

3. A staple cartridge according to claim 1 or claim 2, wherein said cartridge comprises an elongated body, said path for said firing means including one or more longitudinal slots (33) in said elongated body for slidably receiving pusher bars (32) of the surgical stapler, and said cartridge further comprises a plurality of drivers (52) engageable by said pusher bars for ejecting the staples from the cartridge, said lockout mechanism preventing said pusher bars from passing more than once through said longitudinal slots.

4. A staple cartridge according to claim 3, the lockout mechanism comprising a strip (90), slidably within said cartridge and comprising:

a front end (94) emplaced within a narrow hollow (59) located toward the front of said cartridge, said front end comprising a folded spring-loaded portion such that said pusher bars (32) can contact said front end and cause said front end to slide further toward the front of said cartridge such that said spring-loaded portion is actuated to open within said hollow; and

said firing barrier being located on the rear end of said strip, said barrier being placed under a detent means (98) within said cartridge in order to avoid contact with said pusher bars, said barrier being loosened from said detent means upon the sliding of said front end, such that said barrier moves within the path of said pusher bars to prevent said pusher bars from passing within said cartridge upon the retraction of said pusher bars from said cartridge.

5. A staple cartridge according to claim 4, said cartridge being adapted to be held within a narrow channel of said stapler, said cartridge having parallel side walls (86) adapted to fit within said narrow channel, said reloading barrier comprising a resilient ear (181) attached to the side walls of said cartridge and held in place by a cover (182) moved by said pusher bars (32) upon the actuation of said stapler to expose said ear, such that said ear becomes urged outside the width of said channel upon the removal of said cartridge, to prevent reinsertion of said spent cartridge within said channel.

6. A staple cartridge according to claim 5 wherein said cover is pivotable within said cartridge such that the pivoting of said cover causes the exposing of said ear (181).

7. A staple cartridge according to claim 3, said firing barrier (62, 74) being emplaced within and held by said drivers (52) such that when said pusher bar (32) engages said drivers to activate said staples and said pusher bar is retracted from said cartridge,

- said barrier moves into the path of said pusher bars to prevent motion of said pusher bars within said cartridge.
8. A surgical stapler comprising: frame means (40), a cartridge having a plurality of staples, positionable in operative association with said frame means, and firing means (30) including a pusher bar (32) movable relative to said frame means in an initial longitudinal firing movement of the pusher bar down a path (33) in said cartridge to a firing position to fire the staples, and the cartridge having a lockout mechanism preventing a subsequent longitudinal firing movement of the pusher bar after the pusher bar has been moved to a retracted position and including a firing barrier (62, 74, 96) movable from a first position in which the firing barrier does not block movement of said firing means (30) to a second position in which the firing barrier blocks movement of said firing means (30), said firing barrier being moved from said first position to said second position upon firing movement and subsequent retraction of said pusher bar to said retracted position, characterised by said cartridge further comprising a reloading barrier (81, 181) which is movable between a firing position and a blocking position, and which is biased towards said blocking position such that the firing of said firing means causes said reloading barrier to pass from said firing position to said blocking position, said reloading barrier in said blocking position being adapted to prevent the reloading of said spent cartridge in a stapler upon the removal of said spent cartridge from said stapler.
9. A surgical stapler according to claim 8 and comprising a plurality of movable drivers (52) for firing said staples, said cartridge defining at least one longitudinal slot (33), and the pusher bar (32) being movable within said longitudinal slot (33) for engaging said movable drivers, and for moving said drivers in a direction perpendicular to the direction of movement of said pusher bar.
10. A surgical stapler as set forth in claim 9 in which the pusher bar moves said drivers (52) to release said firing barrier (62, 74, 96) during partial movement of said pusher bar.
11. A surgical stapler as set forth in claim 8 in which the cartridge includes a plurality of movable drivers (52) for firing said staples and the drivers preclude the firing barrier (62, 74) from moving into position to prevent firing movement of the pusher bar after it has been moved to a retracted position.
12. A surgical stapler according to any of claims 9 to 11, wherein said firing barrier comprises resilient projecting means (62, 74, 96) normally biased toward a position to engage said pusher bar to prevent movement of said pusher bar relative to said projecting means after said pusher bar has been moved to said retracted position, said drivers (52) being adapted to block said firing barrier to maintain said resilient projecting means out of the path of the pusher bar during staple firing.
13. A surgical stapler according to any of claims 8 to 12, further comprising a firing knob (42) operatively connected to said pusher bar for moving the pusher bar down a path (33) to its firing position to fire the staples, and to its retracted position after at least a portion of the staples have been fired.

Patentansprüche

1. Kassette (50), die lösbar an einem chirurgischen Klammersetzgerät angebracht werden kann, wobei die Kassette chirurgische Klammern enthält und einen Weg (33) aufweist, den sich eine Auslöseinrichtung (32) des chirurgischen Klammersetzgeräts entlang bewegen kann, um das Klammersetzgerät auszulösen, und wobei die Kassette einen Sperrmechanismus enthält mit einer Auslösersperre (62, 74, 96), die durch eine Feder (63, 72) vorgespannt ist, wobei die Sperre vor dem Einsetzen der Kassette in ein chirurgisches Klammersetzgerät vorgespannt ist und die Feder beim Auslösen der Klammersetzgeräts durch die Auslöseinrichtung am Klammersetzgerät derart aktiviert werden kann, daß die Sperre von der Feder veranlaßt wird, sich in den genannten Weg zu bewegen und das Auslösen des Klammersetzgeräts zu verhindern, das mit der benutzten Kassette geladen ist; und mit einer Nachladesperre (81, 181), die sich zwischen einer Auslösestellung und einer Sperrstellung bewegen kann und die derart in die Sperrstellung vorgespannt ist, daß die Auslösung der Auslöseinrichtung die Nachladesperre veranlaßt, sich aus der Auslösestellung in die Sperrstellung zu begeben, wobei die Nachladesperre in der Sperrstellung dafür vorgesehen ist, das Nachladen der verbrauchten Kassette in ein Klammersetzgerät nach dem Entfernen der verbrauchten Kassette aus dem Klammersetzgerät zu verhindern.
2. Klammerkassette nach Anspruch 1, mit einem Indikator (58), der bei der Abgabe der Klammern aktiviert werden kann, um die Abgabe anzuzeigen.
3. Klammerkassette nach Anspruch 1 oder 2, wobei die Kassette einen länglichen Körper umfaßt und der Weg für die Auslöseinrichtung von einem oder mehreren Längsschlitten (33) in dem länglichen

- Körper gebildet wird, die gleitend Ausstoßer (32) des chirurgischen Klammersetzgeräts aufnehmen, und wobei die Kassette des weiteren eine Anzahl von Treibern (52) umfaßt, die mit den Ausstoßern in Eingriff kommen können, um die Klammer aus der Kassette auszustoßen, wobei der Sperrmechanismus die Ausstoßer daran hindert, sich mehr als einmal durch die Längsschlüsse zu bewegen. 5
4. Klammerkassette nach Anspruch 3, wobei der Sperrmechanismus einen Streifen (90) umfaßt, der sich in der Kassette gleitend bewegen kann und der aufweist ein Vorderende (94), das sich in einer schmalen Aushöhlung (59) zur Vorderseite der Kassette hin befindet, wobei das Vorderende einen gefalteten federbelasteten Abschnitt umfaßt, derart, daß die Ausstoßer (32) mit dem Vorderende in Kontakt kommen können und das Vorderende veranlassen können, derart weiter zur Vorderseite der Kassette zu gleiten, daß der federbelastete Abschnitt aktiviert wird und sich in der Aushöhlung öffnet; und 15
wobei sich die Auslösesperre am Hinterende des Streifens befindet, wobei sich die Sperre unter einer Halteeinrichtung (98) in der Kassette befindet, um den Kontakt mit den Ausstoßern zu vermeiden, und wobei die Sperre beim Gleiten des Vorderendes derart aus der Halteeinrichtung freikommt, daß sich die Sperre in den Weg der Ausstoßer bewegt und die Ausstoßer daran hindert, sich nach dem Zurückziehen der Ausstoßer aus der Kassette wieder in die Kassette zu bewegen. 20
25
30
35
5. Klammerkassette nach Anspruch 4, wobei die Kassette dafür vorgesehen ist, in einem schmalen Kanal des Klammersetzgeräts gehalten zu werden, wobei die Kassette parallele Seitenwände (86) hat, die in den schmalen Kanal passen, und wobei die Nachladesperre eine elastische Lasche (181) an den Seitenwänden der Kassette umfaßt, die von einer Abdeckung (182) gehalten wird, die von den Ausstoßern (32) bei der Betätigung des Klammersetzgeräts bewegt wird, um die Lasche freizugeben, derart, daß die Lasche beim Entfernen der Kassette über die Breite des Kanals hinaus gedrückt wird und ein erneutes Einsetzen der benutzten Kassette in den Kanal verhindert. 40
45
50
6. Klammerkassette nach Anspruch 5, wobei die Abdeckung in der Kassette derart schwenkbar ist, daß das Schwenken der Abdeckung das Freisetzen der Lasche (181) bewirkt. 55
7. Klammerkassette nach Anspruch 3, wobei sich die Auslösesperre (62, 74) innerhalb der Treiber (52) befindet und von diesen so gehalten wird, daß, wenn der Ausstoßer (32) mit den Treibern in Eingriff kommt, um die Klammer zu aktivieren, und wenn der Ausstoßer aus der Kassette zurückgezogen wird, sich die Sperre in den Weg des Ausstoßers bewegt und eine Bewegung des Ausstoßers in der Kassette verhindert.
8. Chirurgisches Klammersetzgerät mit einem Rahmen (40), einer Kassette mit einer Anzahl von Klammen, die in operative Verbindung mit dem Rahmen gebracht werden können, und mit einer Auslöseeinrichtung (30) mit einem Ausstoßer (32), der bei einer anfänglichen längsgerichteten Auslösebewegung des Ausstoßers relativ zu dem Rahmen entlang eines Weges (33) in der Kassette in eine Auslösestellung zum Auslösen der Klammen bewegbar ist, wobei die Kassette einen Sperrmechanismus aufweist, der eine folgende längsgerichtete Auslösebewegung des Ausstoßers verhindert, nachdem sich der Ausstoßer in eine zurückgezogene Position bewegt hat, mit einer Auslösesperre (62, 74, 96), die aus einer ersten Stellung, in der die Auslösesperre eine Bewegung der Auslöseeinrichtung (30) nicht behindert, in eine zweite Stellung bewegbar ist, in der die Auslösesperre eine Bewegung der Auslöseeinrichtung (30) blockiert, wobei die Auslösesperre durch eine Auslösebewegung und darauf folgendes Zurückziehen des Ausstoßers in die zurückgezogene Position aus der ersten Stellung in die zweite Stellung gebracht wird, dadurch gekennzeichnet, daß die Kassette eine Nachladesperre (81, 181) aufweist, die zwischen einer Auslösestellung und einer Sperrstellung bewegbar ist und die derart zur Sperrstellung hin vorgespannt ist, daß das Auslösen der Auslöseeinrichtung die Nachladesperre veranlaßt, von der Auslösestellung in die Sperrstellung überzugehen, wobei die Nachladesperre in der Sperrstellung dafür vorgesehen ist, nach dem Entfernen der verbrauchten Kassette aus dem Klammersetzgerät das Nachladen der verbrauchten Kassette in ein Klammersetzgerät zu verhindern. 35
40
45
50
55
9. Chirurgisches Klammersetzgerät nach Anspruch 8, mit einer Anzahl von bewegbaren Treibern (52) zum Auslösen der Klammen, wobei die Kassette wenigstens einen Längsschlitz (33) aufweist, und wobei der Ausstoßer (32) in dem Längsschlitz (33) bewegbar ist, um mit den beweglichen Treibern in Eingriff zu kommen und um die Treiber in einer Richtung zu bewegen, die senkrecht zur Richtung der Bewegung des Ausstoßers ist.
10. Chirurgisches Klammersetzgerät nach Anspruch 9, wobei der Ausstoßer die Treiber (52) bewegt, um die Auslösesperre (62, 74, 96) während einer Teilbewegung des Ausstoßers freizugeben.
11. Chirurgisches Klammersetzgerät nach Anspruch 8,

wobei die Kassette eine Anzahl von bewegbaren Treibern (52) zum Auslösen der Klammern aufweist und die Treiber die Auslösesperrre (62, 74) daran hindern, sich in die Stellung zu bewegen, bei der die Auslösebewegung des Ausstoßers verhindert wird, nachdem er sich in eine zurückgezogene Stellung bewegt hat.

12. Chirurgisches Klemmsetzgerät nach einem der Ansprüche 9 bis 11, wobei die Auslösesperrre elastische vorstehende Mittel (62, 74, 96) umfaßt, die normalerweise in eine Stellung vorgespannt sind, in der sie mit dem Ausstoßer in Eingriff kommen und eine Bewegung des Ausstoßers relativ zu den vorstehenden Mitteln verhindern, nachdem sich der Ausstoßer in eine zurückgezogene Stellung bewegt hat, und wobei die Treiber (52) dafür vorgesehen sind, die Auslösesperrre zu blockieren, um die elastischen vorstehenden Mittel bei der Abgabe von Klammern aus dem Weg für den Ausstoßer zu halten.

13. Chirurgisches Klemmsetzgerät nach einem der Ansprüche 8 bis 12, mit einem Auslösekopf (42), der operativ mit dem Ausstoßer verbunden ist, um den Ausstoßer entlang eines Weges (33) in die Auslösestellung zur Abgabe der Klammern und in seine zurückgezogene Stellung zu bewegen, nachdem wenigstens ein Teil der Klammern ausgegeben wurden.

Revendications

1. Cartouche (50) qui peut être fixée de manière amo-
vible à une agrafeuse chirurgicale, ladite cartouche
contenant des agrafes chirurgicales et ayant une
voie (33) à l'intérieur de laquelle des moyens de
déchargeement (32) à partir d'une agrafeuse chirur-
gicale peut se déplacer afin de décharger ladite
agrafeuse et un mécanisme de blocage compre-
nant :

une barrière de déchargement (62, 74, 96)
chargée par un ressort (63, 72), ladite barrière
étant préchargée sur ladite cartouche avant
l'insertion de ladite cartouche dans une agrafeuse
chirurgicale, ledit ressort étant actionnable
lors du déchargeement de ladite agrafeuse
par des moyens de déchargement situés sur
ladite agrafeuse, de telle sorte que ledit ressort
provoque le déplacement de ladite barrière
dans la voie afin d'empêcher le nouveau
déchargeement de ladite agrafeuse chargée
avec ladite cartouche épuisée ; et
une barrière de recharge (81, 181) qui
peut se déplacer entre une position de déchar-
gement et une position de blocage, et qui est
pressée en direction de ladite position de blo-
cage de telle sorte que le déchargeement des-

dits moyens de déchargement entraîne le
passage de ladite barrière de recharge-
ment de ladite position de décharge-
ment à ladite position de blocage, ladite barrière de recharge-
ment dans ladite position de blocage étant
adaptée pour empêcher le recharge-
ment de ladite cartouche épuisée dans une agrafeuse
lors de l'enlèvement de ladite cartouche épuisée
de ladite agrafeuse.

2. Cartouche d'agrafes selon la revendication 1, com-
prenant en outre un indicateur (58) actionnable lors
du déchargeement desdites agrafes pour indiquer
ledit déchargeement.
3. Cartouche d'agrafes selon la revendication 1 ou la
revendication 2, dans laquelle ladite cartouche
comprend un corps allongé, ladite voie pour lesdits
moyens de déchargement y compris une ou plu-
sieurs fentes longitudinales (33) dans ledit corps
allongé pour recevoir par glissement les barres de
poussée (32) de l'agrafeuse chirurgicale, et ladite
cartouche comprend en outre de multiples entraî-
nements (52) pouvant se mettre en prise par l'inter-
médiaire desdites barres de poussée pour éjecter
les agrafes de la cartouche, ledit mécanisme de
blocage empêchant lesdites barres de poussée de
passer plus d'une fois à travers lesdites lon-
gitudinales.
4. Cartouche d'agrafes selon la revendication 3, le
mécanisme de blocage comprenant une bande
(90) pouvant glisser à l'intérieur de ladite cartouche
et comprenant :

une extrémité avant (94) logée à l'intérieur d'un
creux étroit (59) situé à l'avant de ladite cartou-
che, ladite extrémité avant comprenant une
partie repliée chargée par ressort de telle sorte
que les barres de poussée (32) puissent entrer
en contact avec ladite extrémité avant et provo-
quent le glissement de ladite extrémité avant
vers l'avant de ladite cartouche de telle sorte
que ladite partie chargée par ressort est
actionnée pour s'ouvrir dans ledit creux ; et
ladite barrière de déchargement étant située
sur l'extrémité arrière de ladite bande, ladite
barrière étant placée sous des moyens de
détente (98) à l'intérieur de ladite cartouche
afin d'éviter le contact avec lesdites barres de
poussée, ladite barrière se détachant desdits
moyens de détente lors du glissement de ladite
extrémité avant, de telle sorte que ladite bar-
rière se déplace à l'intérieur de la voie desdites
barres de poussée afin d'empêcher lesdites
barres de poussée de traverser ladite cartou-
che lors de la rétraction desdites barres de
poussée de ladite cartouche.

5. Cartouche d'agrafes selon la revendication 4, ladite cartouche étant adaptée pour être retenue à l'intérieur d'une rainure étroite de ladite agrafeuse, ladite cartouche ayant des parois latérales parallèles (86) adaptées pour s'ajuster dans ladite rainure étroite, ladite barrière de rechargeant comprenant une oreille élastique (181) fixée aux parois latérales de ladite cartouche et maintenue en place par un couvercle (182) déplacé par lesdites barres de poussée (32) lors de l'actionnement de ladite agrafeuse pour exposer ladite oreille, de telle sorte que ladite oreille soit pressée hors de la largeur de ladite rainure lors de l'enlèvement de ladite cartouche, afin d'empêcher la réinsertion de ladite cartouche épuisée à l'intérieur de ladite rainure. 5
6. Cartouche d'agrafes selon la revendication 5, dans laquelle ledit couvercle peut être pivoté à l'intérieur de ladite cartouche de telle sorte que le pivotement dudit couvercle provoque l'exposition de ladite oreille (181). 10
7. Cartouche d'agrafes selon la revendication 3, ladite barrière de déchargeant (62, 74) étant logée à l'intérieur et maintenue en place par lesdits entraînements (52) de telle sorte que lorsque ladite barre de poussée (32) se met en prise avec lesdits entraînements à actionner lesdites agrafes et que la barre de poussée est rétractée de ladite cartouche, ladite barrière pénètre dans la voie desdites barres de poussée afin d'empêcher le déplacement desdites barres de poussée l'intérieur de ladite cartouche. 15
8. Agrafeuse chirurgicale comprenant : des moyens de cadre (40), une cartouche ayant une pluralité d'agrafes, pouvant être mise en position de fonctionnement avec lesdits moyens de cadre et des moyens de déchargeant (30) incluant une barre de poussée (32) pouvant se déplacer par rapport auxdits de cadre dans un mouvement de déchargeant longitudinal initial de la barre de poussée le long d'une voie (33) dans ladite cartouche jusqu'à une position de déchargeant pour décharger les agrafes, et la cartouche étant munie d'un mécanisme de blocage empêchant tout mouvement de déchargeant longitudinal ultérieur de la barre de poussée après le déplacement de la barre de poussée jusqu'à une position rétractée et incluant une barrière de déchargeant (62, 74, 96) pouvant se déplacer d'une première position dans laquelle la barrière de déchargeant ne bloque pas le mouvement desdits moyens de déchargeant (30) à une seconde position dans laquelle la barrière de déchargeant bloque le mouvement desdits moyens de déchargeant (30), ladite barrière de déchargeant se déplaçant de ladite première position jusqu'à ladite seconde position lors du mouvement de déchargeant et de la rétraction 20
9. Agrafeuse chirurgicale selon la revendication 8 et comprenant une pluralité d'entraînements mobiles (52) pour décharger lesdites agrafes, ladite cartouche définissant au moins une fente longitudinale (33), et la barre de poussée (32) pouvant se déplacer dans ladite fente longitudinale (33) pour mettre en prise lesdits entraînements mobiles et pour déplacer lesdits entraînements mobiles dans une direction perpendiculaire à la direction du mouvement de ladite barre de poussée. 25
10. Agrafeuse chirurgicale selon la revendication 9, dans laquelle la barre de poussée déplace lesdits entraînements (52) afin de débloquer ladite barrière de déchargeant (62, 74, 96) pendant le mouvement partiel de ladite barre de poussée. 30
11. Agrafeuse chirurgicale selon la revendication 8, dans laquelle la cartouche inclut une pluralité d'entraînements mobiles (52) pour décharger lesdites agrafes et les entraînements empêchent la barrière de déchargeant (62, 74) de se déplacer jusqu'à une position empêchant le mouvement de déchargeant de la barre de poussée après qu'elle s'est déplacée jusqu'à une position rétractée. 35
12. Agrafeuse chirurgicale selon l'une quelconque des revendications 9 à 11, dans laquelle ladite barrière de déchargeant inclut des moyens saillants élastiques (62, 74, 96), normalement pressés vers une position permettant de mettre en prise ladite barre de poussée pour empêcher le mouvement de ladite barre de poussée par rapport auxdits moyens saillants après le déplacement de ladite barre de poussée en position rétractée, lesdits entraînements (52) étant adaptés pour bloquer ladite barrière de déchargeant afin de maintenir lesdits moyens saillants élastiques hors de la voie de la barre de poussée pendant le déchargeant des agrafes. 40
13. Agrafeuse chirurgicale selon l'une quelconque des revendications 8 à 12, comprenant également un ultérieure de ladite barre de poussée jusqu'à ladite position rétractée, caractérisée par ladite cartouche et comprenant en outre une barrière de rechargeant (81, 181) qui peut être déplacée entre une position de déchargeant et une position de blocage, et qui est pressée en direction de ladite position de blocage de telle sorte que le déchargeant desdits moyens de déchargeant provoque le passage de ladite barrière de rechargeant de ladite position de déchargeant à ladite position de blocage, ladite barrière de rechargeant dans ladite position de blocage étant adaptée pour empêcher le rechargeant de ladite cartouche épuisée dans une agrafeuse lors de l'enlèvement de ladite cartouche épuisée de ladite agrafeuse. 45

bouton de déchargement (42), dont le fonctionnement est connecté à ladite barre de poussée pour déplacer la barre de poussée le long d'une voie (33) jusqu'à sa position de déchargement afin de décharger les agrafes et jusqu'à sa position rétractée après qu'une partie des agrafes a au moins été déchargée.

10

15

20

25

30

35

40

45

50

55

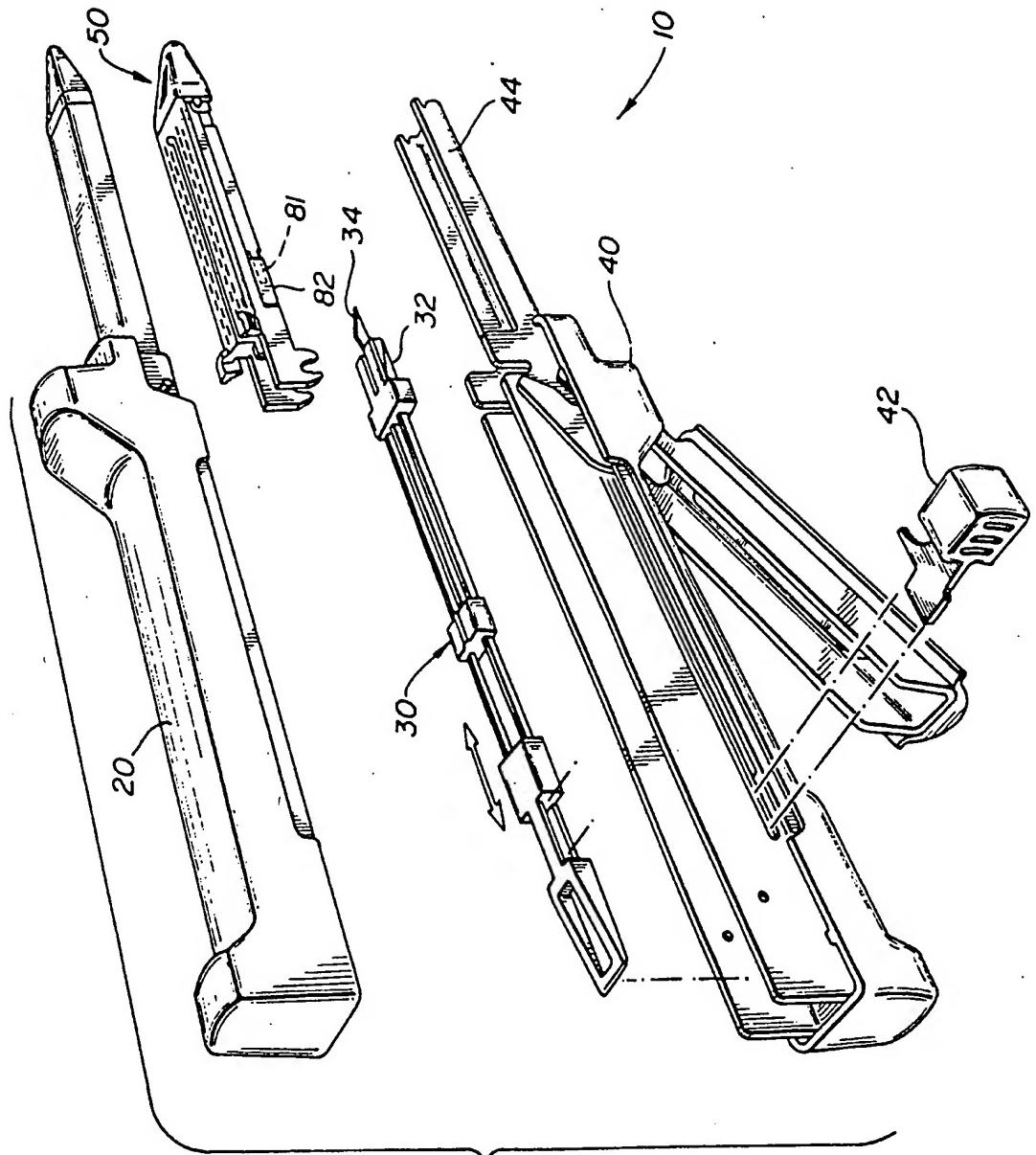


FIG-1

FIG-2

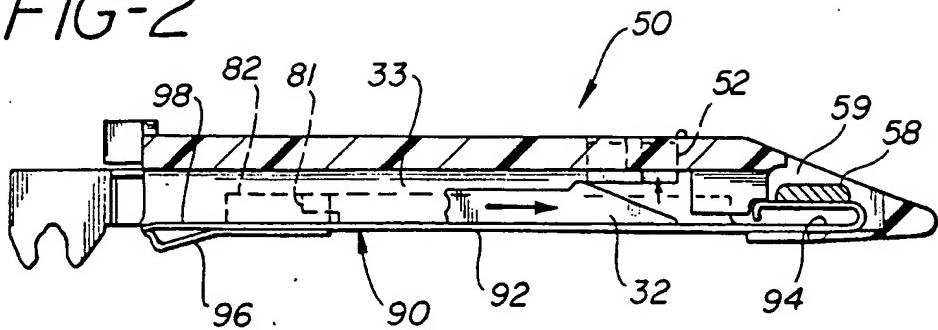


FIG-3

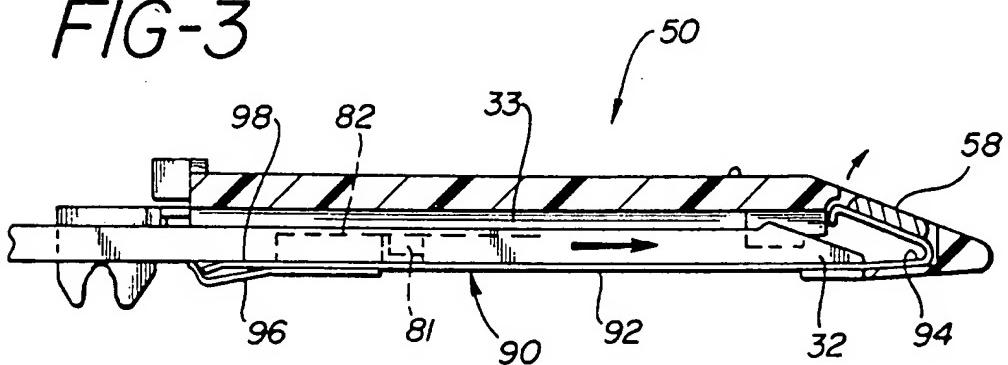


FIG-4

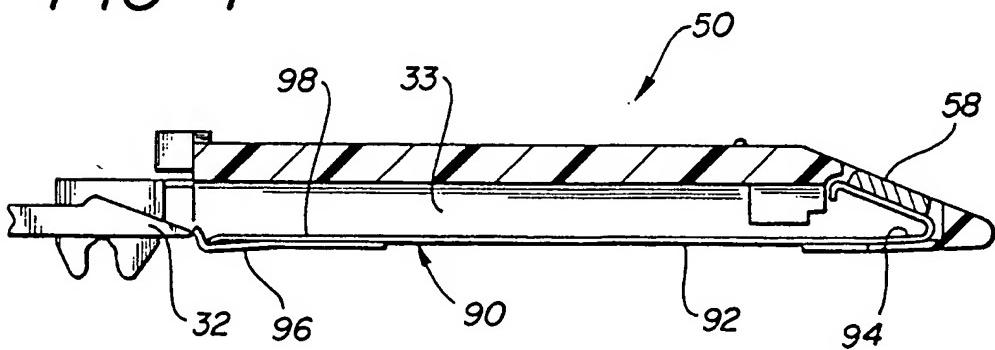


FIG-5

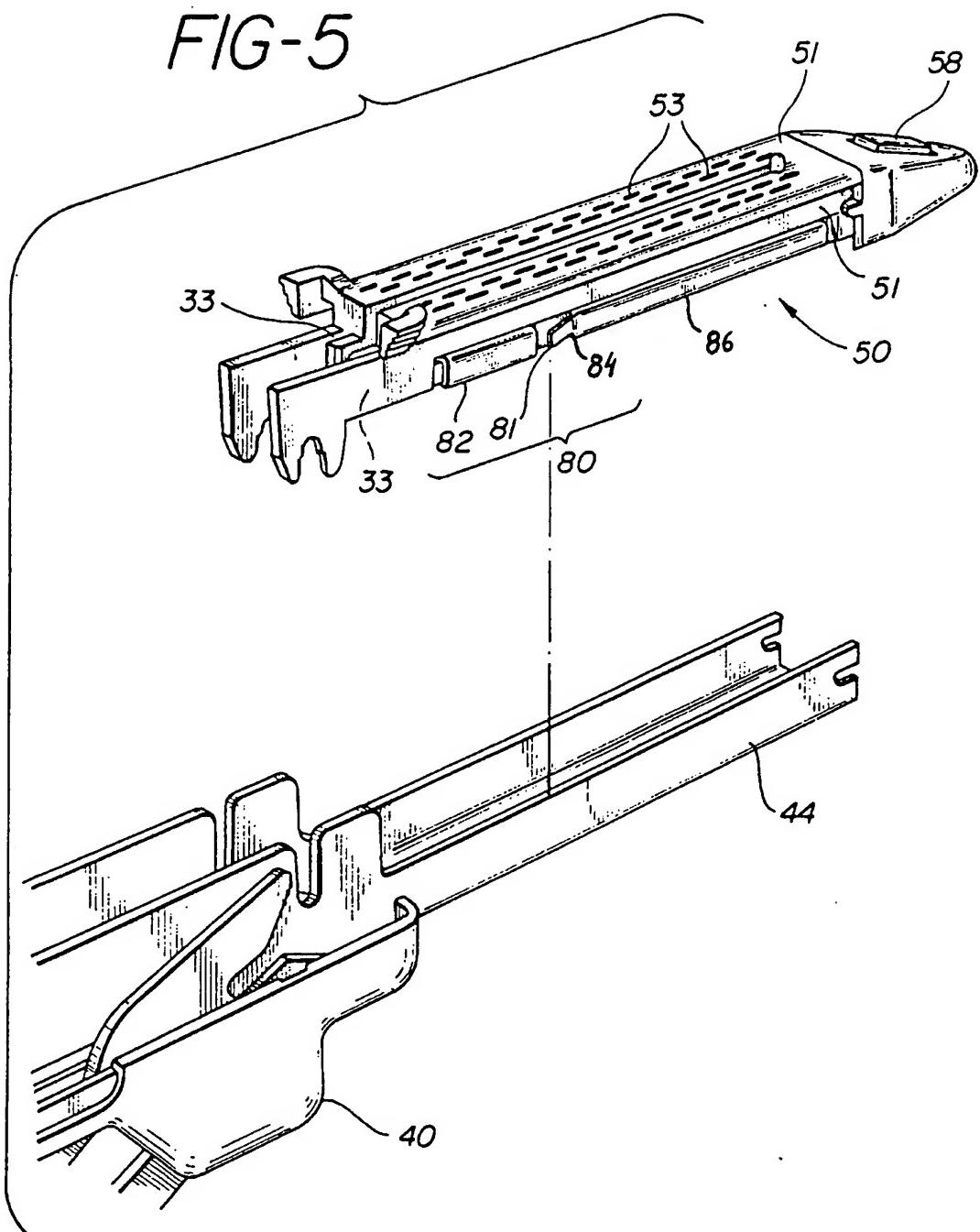


FIG-6

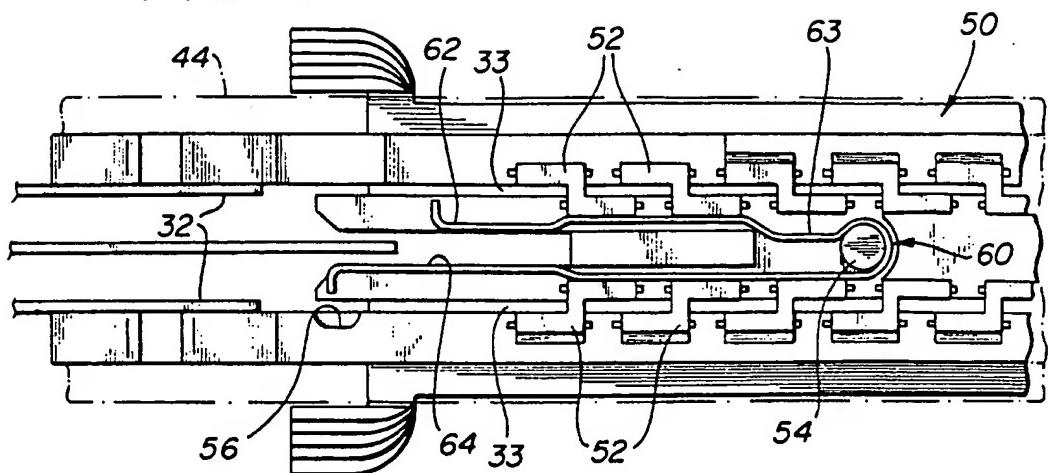


FIG-7

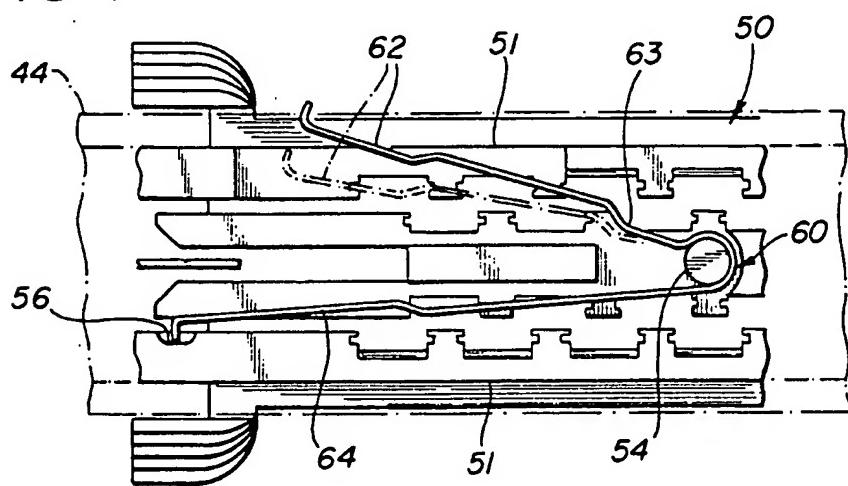


FIG-8

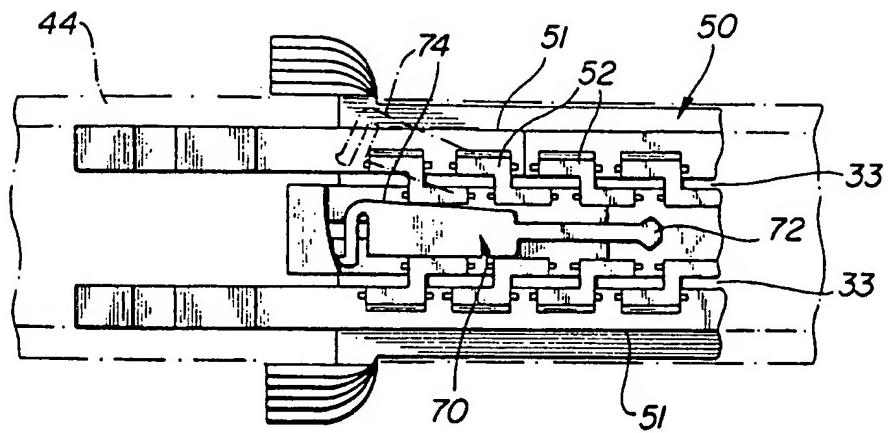


FIG-9

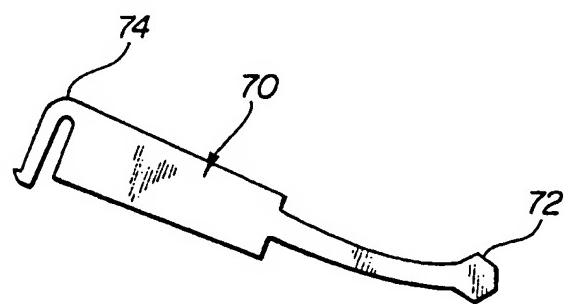


FIG-10

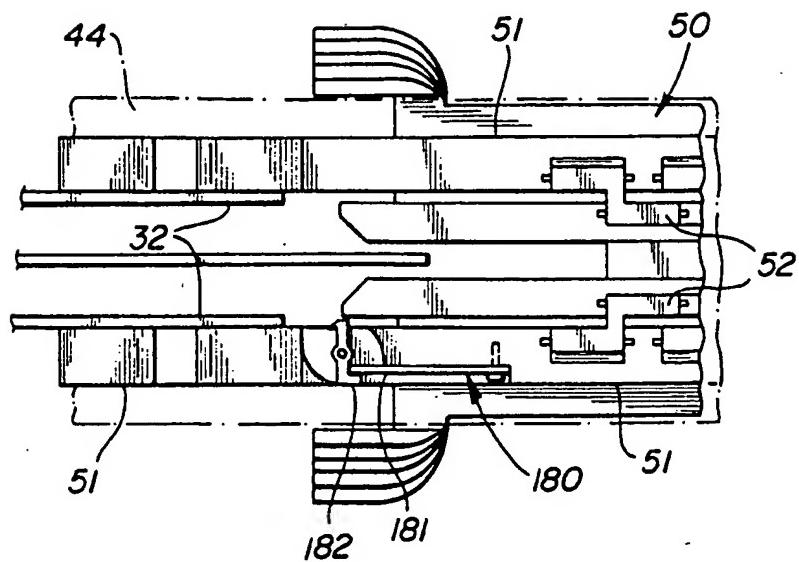
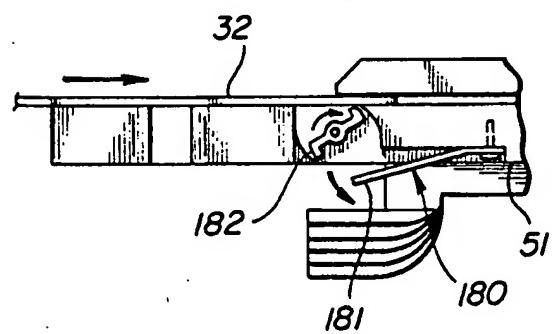


FIG-11



**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- BLACK BORDERS**
- IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- FADED TEXT OR DRAWING**
- BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- SKEWED/SLANTED IMAGES**
- COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- GRAY SCALE DOCUMENTS**
- LINES OR MARKS ON ORIGINAL DOCUMENT**
- REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.